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FIG. 1

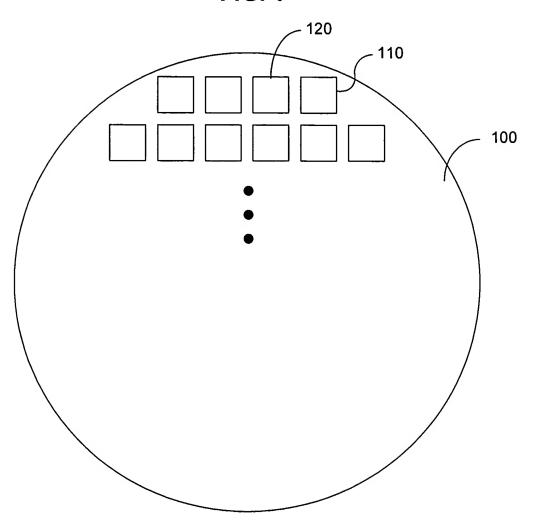
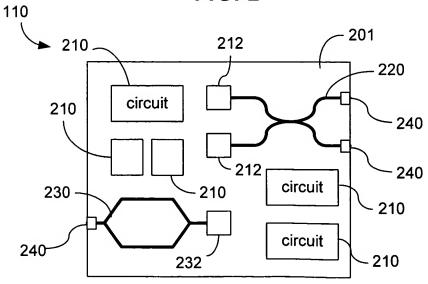
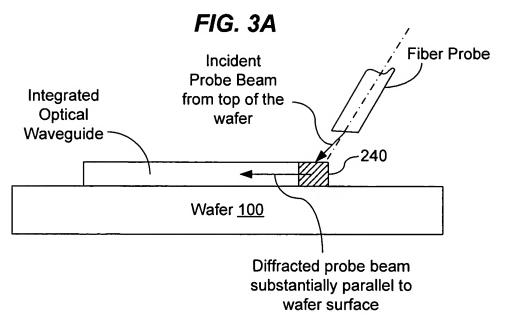
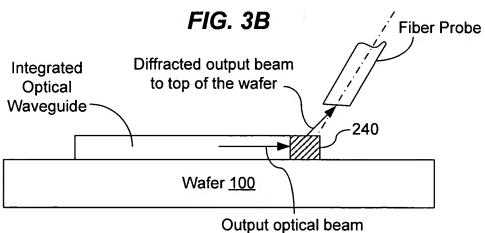


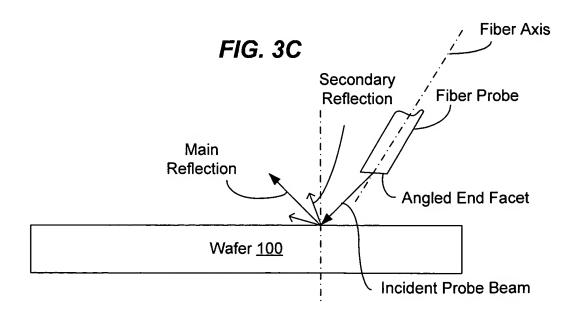
FIG. 2



WAFER-LÉVEL TESTING OF OPTICAL AND







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FIG. 4



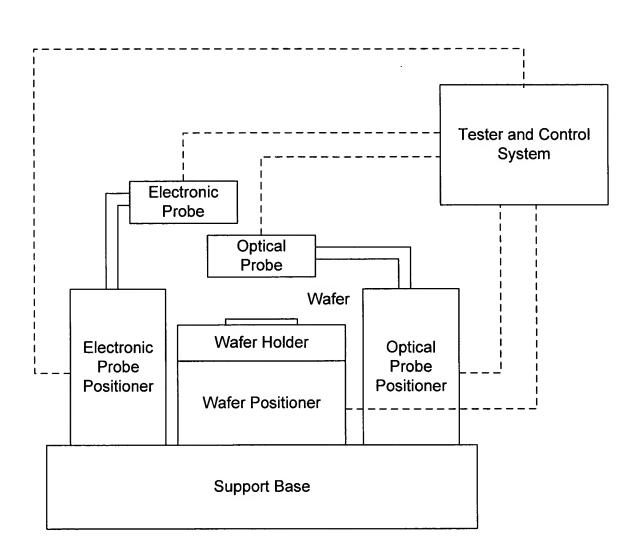


FIG. 5

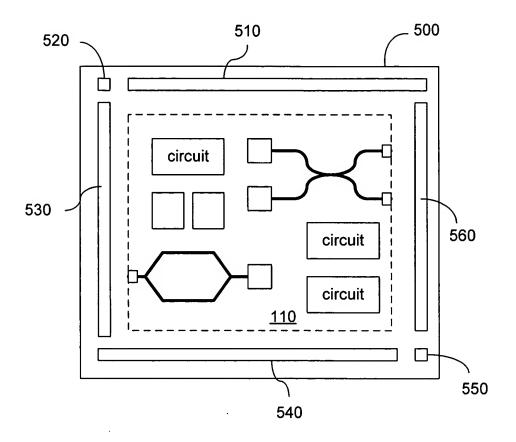
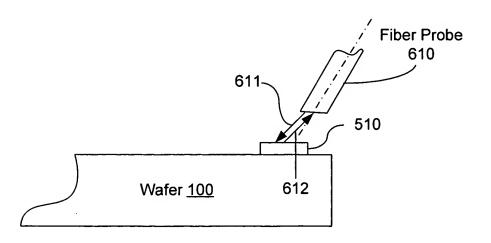
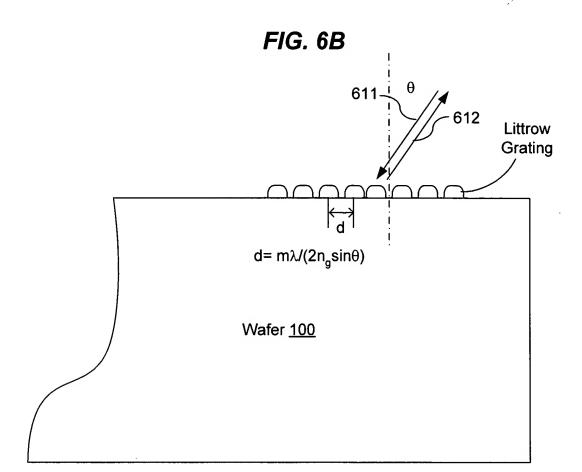
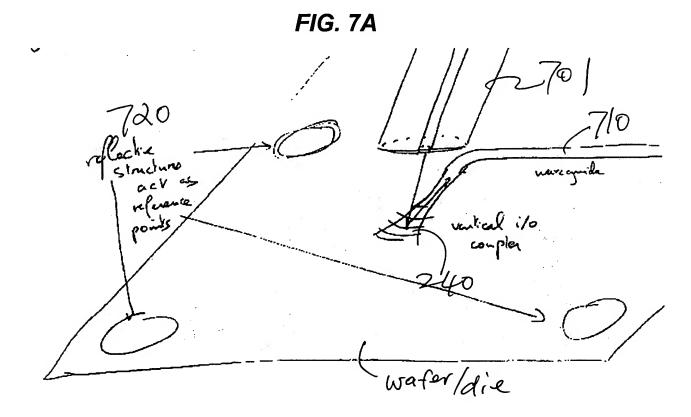


FIG. 6A



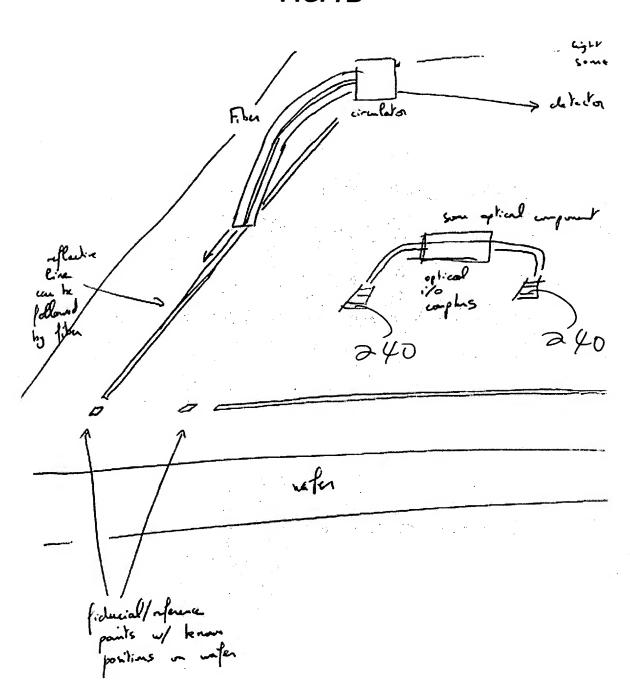
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FIG. 7B



WAFER-LEVEL TESTING OF OPTICAL AND

FIG. 8A

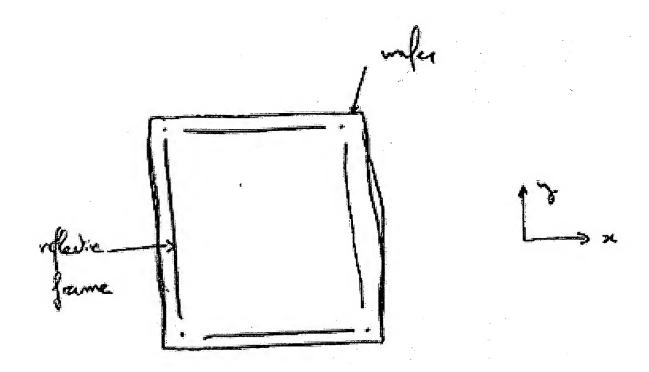
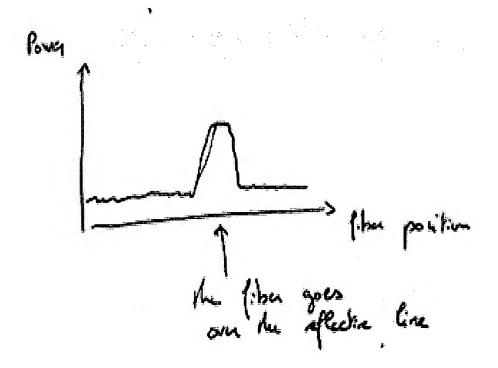


FIG. 8B



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FIG. 8C

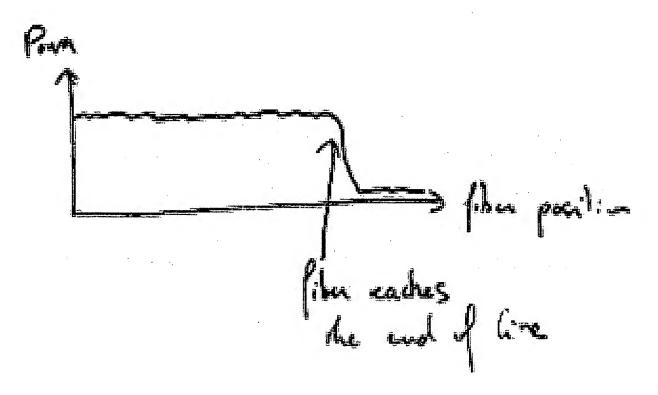
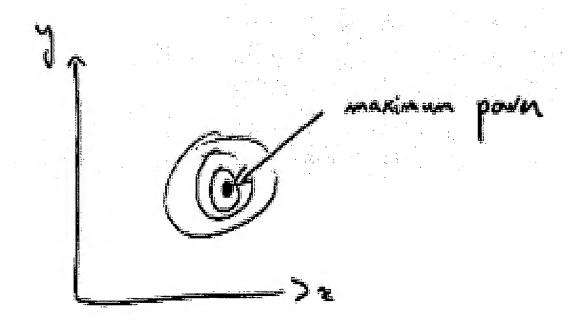
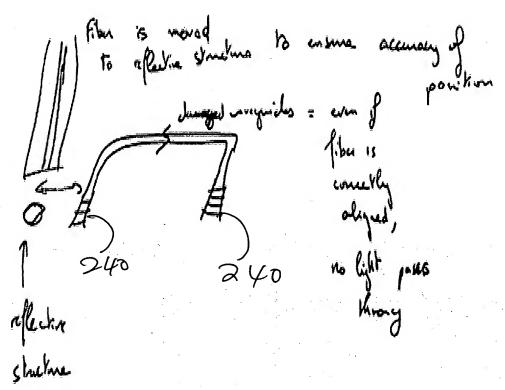


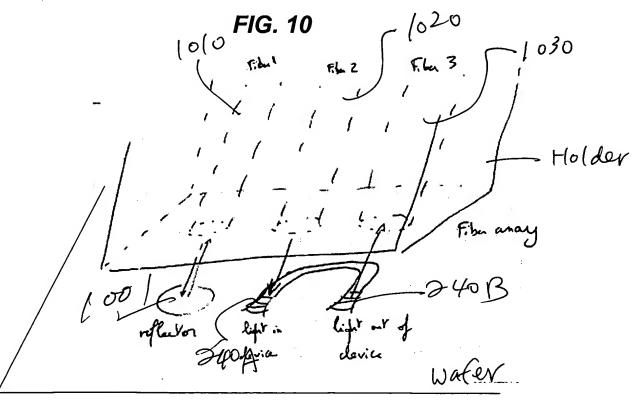
FIG. 8D



WAFER-LEVEL TESTING OF OPTICAL AND

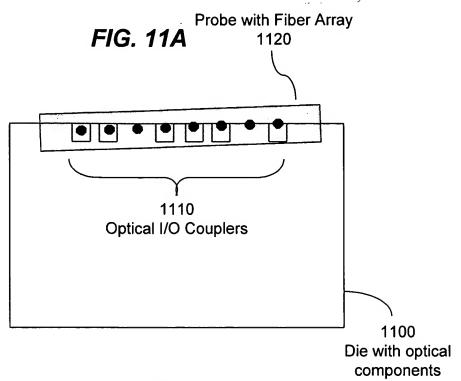
FIG. 9





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FIG. 11B

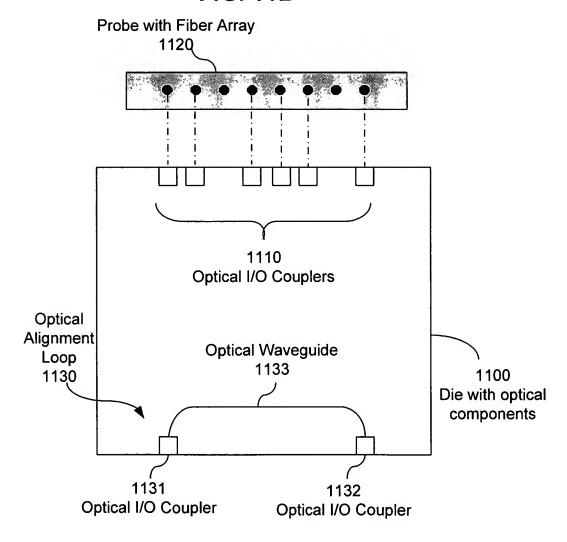
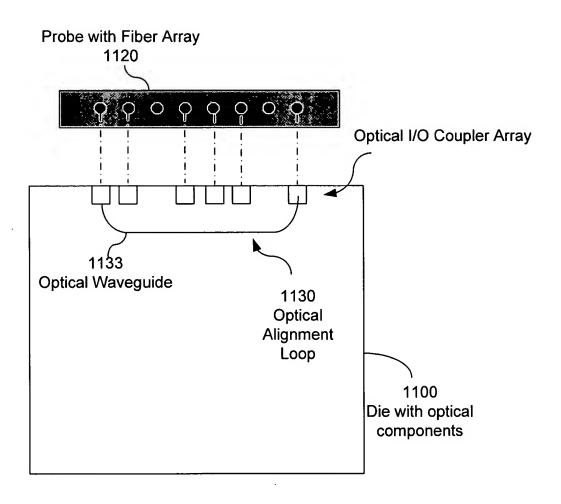
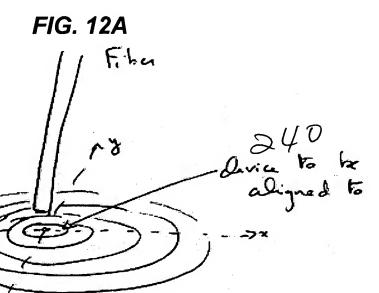


FIG. 11C

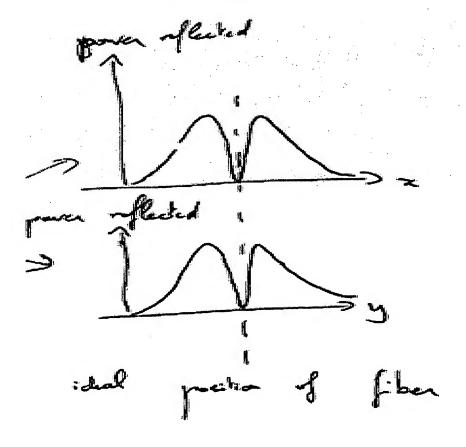


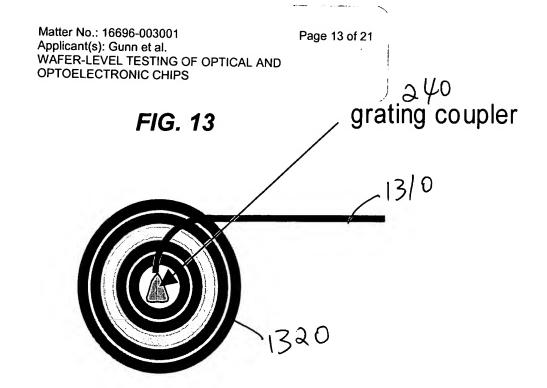
WAFER-LEVEL TESTING OF OPTICAL AND

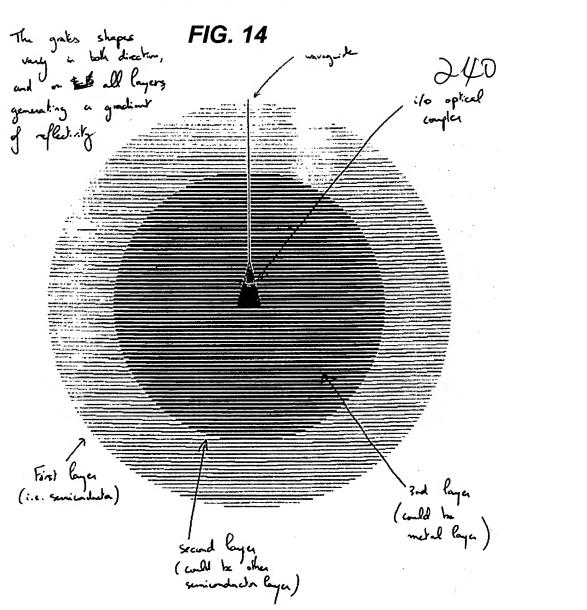


reflecta v

FIG. 12B







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## FIG. 15A

Control the wafer positioner to move the wafer and to place a selected die under test at a predetermined test location under the optical probe

Adjust the position of the wafer positoiner to search for a strong reflection of the probe beam from an optical reference mark around the selected die

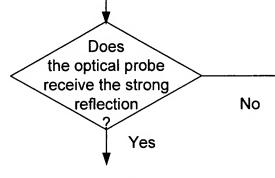


FIG. 15B

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## FIG. 15B

**FIG. 15A** 

Control the wafer positioner to move the relative position of the optical probe from the known location at one optical reference mark to an optical port of a selected optical component in the selected die according to a predetermined position map to obtain an output response from the selected die caused by probe light received by the optical port

While maintaining the wafer positioner fixed in position, adjust the position of the optical probe according to a fine alignment algorithm to maximize the output response

Fix the relative position of the optical probe with respect to the selected optical component where the output response is maximal

Perform a predetermined test on the optical component

FIG. 15C

WAFER-LÉVEL TESTING OF OPTICAL AND

FIG. 15C

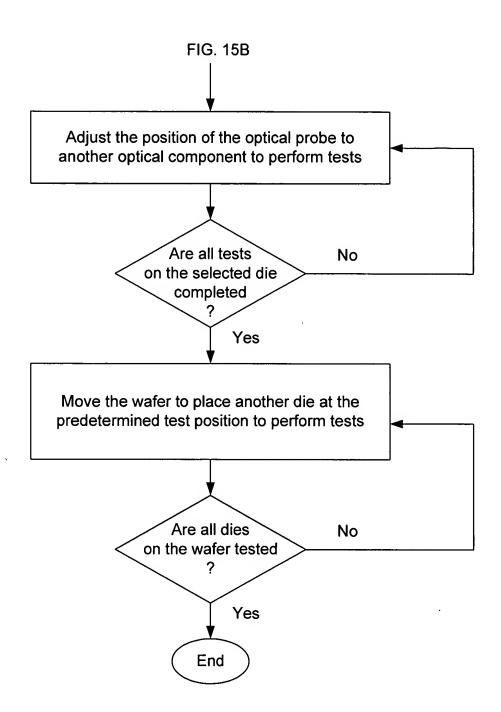
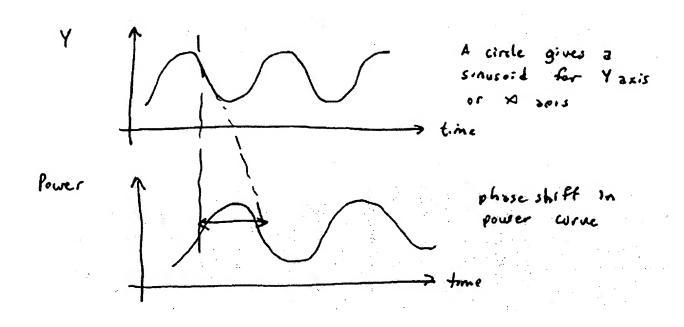


FIG. 15D



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FIG. 16

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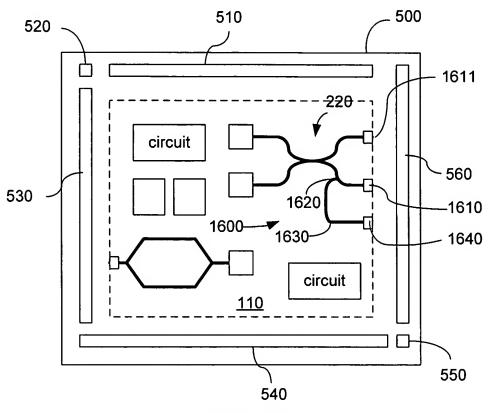


FIG. 17

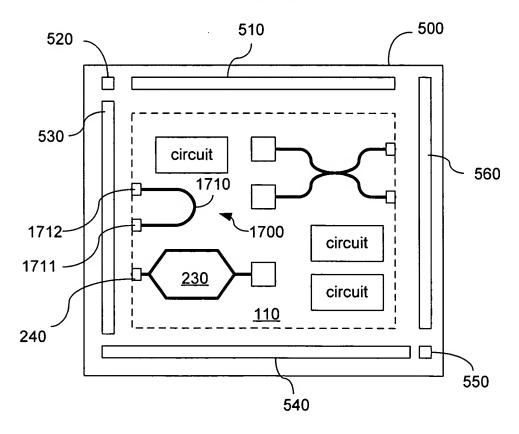


FIG. 18

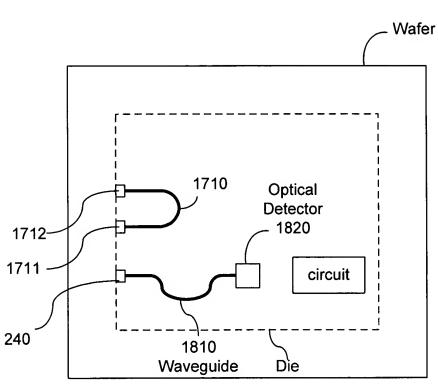
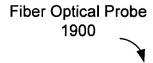
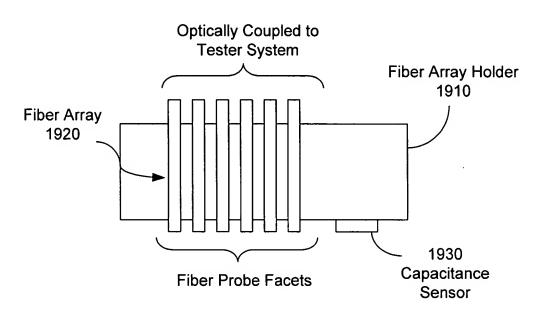


FIG. 19





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## FIG. 20

Upon receiving a command to move the optical probe to a different relative location, control the wafer positioner to lower the height of the wafer holding chuck to the preset separate position

While maintaining the wafer at the lowered height, control the optical probe positioner to raise the height of the optical probe

control the wafer positioner to move the wafer to a selected lateral location under the optical probe (an optical alignment structure on the wafer may be used to set the selected lateral location)

Control the wafer positioner to raise the wafer to the testing position close to the optical probe

Control the optical probe positioner to lower the height of the optical probe to a desired spacing by using the spacing measurement from a spacing sensor in the optical probe

Use the optical probe to perform optical testing on the wafer